Compliance Monitoring
Protocols
Western and Eastern Washington

OVERVIEW AND CONTACT INFORMATION

This document serves as instructions and a quick reference for the compliance monitoring field data collection. If you have any questions, contact the Compliance Monitoring Program. This information was pulled from the following sources: the "Initial Compliance Monitoring Study Program: State of Washington Forest Practices Rules, Draft Proposal, May 14, 2006," by Leslie Lingley, Forest Practices Rules and Board Manual, and current and archived Forest Practices Applications Instructions. Please read the Forest Practices Compliance Monitoring Program Design to get a detailed overview of the Program and work to be conducted on the Forest Practice Application (FPA) reviews.

The compliance monitoring SharePoint site can provide information for DNR employees on FPA scheduling, contacts, stream segment selection, and issues regarding compliance monitoring field reviews.

Walt Obermeyer
Compliance Monitoring Program Manager (CMPM)
Forest Practices Division
Office: (360) 902-1366

Ritch Wood
Compliance Monitoring Field Coordinator (CMFC)
Forest Practices Division
Office: (360) 902-2137
Cell: (360) 789-1432

RESPONSIBILITIES OF FOREST PRACTICE FORESTERS (FPFs) AS REGION REPRESENTITIVES FOR FIELD REVIEWS

1. Coordinate dates for compliance monitoring field reviews with the Compliance Monitoring Field Coordinator:
   a. Assigned weeks. The region will work with the Compliance Monitoring Field Coordinator at the beginning of the sampling season in to reserve weeks for the region reviews
   b. Coordinate dates with the CMFC so that information can be posted to shared digital calendar(s).

   c. Review the field schedule and confirm the participation of Washington Department of Ecology (DOE) and the Washington Department of Fish and Wildlife (WDFW) participants by email or phone calls to confirm field dates at least three weeks in advance.
   d. Try to coordinate field days consecutively so that DOE and WDFW can optimize their field days and hotel accommodations.
   e. Contact appropriate tribal contacts for your particular region and/or district.
   f. Give the landowner a notification call with the dates that you will be reviewing their application.

i. The landowner may attend the assessment; and they can clarify elements of the FPA. However, they cannot be part of the decision making process for determining the compliance of their activities.

2. Assure that the Forest Practice Forester (FPF) that approved the FPA provides site directions and logistical information.
3. Assure that the FPF who approved the original application will not participate in making decisions for that site.
4. Check the FPA jacket in your region that may contain any other information on the FPA as Informal Conference Notes, Water Type Modification Forms, etc. Create PDF copies of the complete file and provide to the Compliance Monitoring Field Coordinator for electronic distribution Bring copies of these to the field review. This must include other FPAs linked or related in some manner such as through an Alternate Plan or other set asides.
5. When the review lead, be sure that the prescribed field methods are being used consistently.
6. Make sure that consistency is maintained throughout the field season, and at each site.
7. Use the field note and form templates provided to document findings for all of the riparian assessments.
8. If unable to attend, provide another DNR region Forest practice staff to participate in the review.
9. Assure that the necessary items are brought to the field.
10. Bring appropriate field gear: SEE NECESSARY FIELD ITEMS.

RESPONSIBILITIES OF DOE AND WDFW PERSONNEL

1. Respond to scheduling requests for field days in a timely manner.
   a. If your region has designated dates for compliance monitoring, try to keep those dates open for compliance monitoring field reviews.
   b. If you are unable to attend a scheduled field day, attempt to find a replacement from your respective agency.
2. SEE NECESSARY FIELD ITEMS. Come prepared with at least the following field gear and supplies:
   a. Field vest: paper, pencils, permanent pen/paint pen, and loggers tape with diameter measurement.
   b. Bring laser range finder, two way radios, etc., if you have them available to you.
   c. Any items requested by the lead DNR person, if you have them available to you.
3. Participate in field measurements following the protocols and instructions from DNR lead.
   a. If you have concerns over how the field work is being conducted, discuss with DNR lead and consult protocols.
4. Provide constructive discussion of the questions in the field forms.
5. If there is disagreement about the rule:
   a. Consult the rule book along with constructive discussion of the rule in question.
   b. The DNR lead has the final call on field procedures and answers on the field forms.
   c. It is up to the DNR lead to be accountable for accuracy and consistency of the field work.
   d. If you have any concerns that aren't being fulfilled by the DNR lead, please contact the CMFC or CMPM.
6. Provide copies of all field notes recorded during the review to the Compliance Monitoring Field Coordinator

GENERAL RESPOSIBILITIES-ALL PARTICIPANTS

1. Read and be familiar with these protocols and the Program Design

2. Suggested procedures for office review of FPAs prior to fieldwork

Open each application on FPARS, double check FPA # against list for region

Confirm approval date is within our sample window

Make sure FPA includes activities we are sampling (riparian, roads)

Print FPA to bring with on field review

Examine office checklist for flagged items that might affect our work, e.g. 20 Ac XMT, Alt Plans, HCP, BTO etc.

Note T-R-S for checking and printing maps on FPARS

Print current activity, water typing and site class maps for each FPA for reference in field, and attach to your copy of FPA

Note types of harvest, equipment and acreage listed in table at harvest question

Note road activities to be reviewed in table at road construction question

Check wetland types, associated activities and WMZs, if any, in wetlands table

Check activities proposed over typed waters from table: if skidding, watch for ground disturbance; if cable yarding, note that trees cut in RMZ might be for corridors, tailholds etc.

Type F RMZ table: note segment IDs, stream widths, site classes, CMZs and harvest codes

Type Np RMZ table: note whether full or partial buffer; check lengths proposed against rule requirements, distances from nearest Type F, etc.

Check additional information provided by applicant for anything pertinent or useful

Maps: include current activity map? current hydro layer? (especially important for FPAs with multiple renewals, and those where corporate maps are substituted for FPARS maps)

Check WTCW and/or WTMF, if any; note descriptions of physicals used to verify water types

Notice of Decision page: any conditions added by approving forester?

Any amendments that affect what we're looking at?

For renewals, be sure original FPA is included; if not, obtain from region

List all water and wetlands types and their prescriptions, as well as road activities, and any issues noted during review, on front page of FPA to be sure they are not missed during fieldwork

FIELD DISCUSSIONS AND DECISIONS

1. Field Discussions
   a. Facilitating discussions regarding specific Forest Practices rules, bankfull width determinations, wetlands or other topics associated with the FPA review.
      i. The lead forester should facilitate these discussions in a manner in which all people voice their opinions.
      ii. This discussion should usually last a maximum of 15 minutes in order to keep the process moving.
      iii. Comments will be noted in the field forms and also on the Post Survey Evaluation Form regarding any non-consensus opinions.
      iv. This procedure is similar to Interdisciplinary Teams for Class IV Special applications, and the decisions are ultimately the responsibility of the DNR.
2. Water Type Modification Forms
   a. If these forms are submitted with the application, or are provided by the lead forester during the review, we will not challenge these forms, rather note the differences on the supplemental water evaluation form.
   b. Comments and concurrence has occurred before compliance monitoring review.
   c. Any person can challenge these forms, and this is an issue beyond compliance monitoring.
3. Decisions
   a. All compliance monitoring decisions will be made in the field.
      i. Issues regarding rules or specific interpretations will be presented to the DNR Compliance Monitoring Program Manager for clarification within the Forest practices division.
      ii. Consultation with the Forest Practices Operations Manager will occur, and a prompt reply to the field review team will be made.
      iii. If the issue has broad application, the clarifications and explanations will be provided to all the compliance monitoring participants.
      iv. Inform all field review participants of outcome once a decision is reached, including basis for the decision

4. TFW processes
   a. Communication protocols and guidance on rule interpretation
      i. When field teams encounter a situation where rules are not clear for a particular FPA due to conflicting information, non-consensus on field protocols, the lead forester will contact the DNR CMPM or CMFC and there will be a consultation with the Forest Practices Division Operation Manager for rule guidance.
      ii. The CMPM will distribute this information to all the compliance monitoring participants. There is a good chance that there are similar questions in other regions.
   b. Issues and suggestions to the Program
      i. If there are concerns regarding field protocols or conduct of the field participants contact the Program Manager. A meeting will be scheduled so concerns can be addressed.
      ii. CMP staff meetings will include the Forest Practices Operations Manager and/or the pertinent responsible manager for either WDFW and DOE
   c. Agenda topics will be received at least one week before informal meetings with DNR, DOE, and WDFW meeting. This assures that necessary information is gathered.

FIELD NOTES TEMPLATES AND FORMS TO RECORD NECESSARY FIELD REVIEW DATA

1. Documentation for field assessments will consists of:

a. Field notes templates.
   i. These templates are designed for each different activity for compliance monitoring field visits.
   ii. Templates are used when measuring all stream segment and WMZ requirements (including but not limited to: Outer zone trees, inner zone trees, stumps found in a no cut area, bank full width, stream length) that could be used in determining a compliance status or rating.
   iii. Templates are the documentation to support answers on the field forms.
b. Field forms
   i. The forms are composed of a series of questions derived from WAC language related to a specific rule activity measured in the field.
   ii. The field forms use the information from the notes templates to assess the particular activity.
   iii. These forms lead to a compliance result.
   iv. Fill out field forms only for those activities that actually took place on the ground
c. The Post Survey Evaluation Form
   i. This form is used to document the status of compliance for all activities, both with the rules and with the FPA as approved.
   ii. These determinations are to be made in the field before leaving the site so any questions that would lead to revisiting a particular segment to ensure the appropriate call can be made.
   iii. Only answer the compliance status for the activities for which a field form was completed.
   iv. This form shall be signed by all participants.
d. Extenuating circumstances
   i. A determination may hinge on a piece of information that was not available at the time of the field assessment.
   ii. The Program Manager will consult with the Operations Assistant Division Manager and will notify the field assessment team of the result.

2. The field notes and field forms are available on the compliance monitoring SharePoint site **FIELD POSITIONS AND DUTIES**

1. Field review participants are expected to be able to perform all field duties. To reduce the perception of bias by having a single agency or person doing the same field work, the following steps are recommended in assigning the various field positions.
   a. Each riparian activity usually has at least 3 field data positions to be filled to accomplish the review. These positions can be split amongst multiple person depending on number of participants:
      i. Determining bankfull widths and stream stations.
      ii. Laser range finder
      iii. Second person for taking notes and measuring and counting trees
   b. Team members need to rotate positions so that no one person dominates in any one position.
   c. the team at streamside should include one DNR and one non-DNR person, and others called to confer when issues arise on BFWs, CMZs and associated wetlands.

NECESSARY FIELD ITEMS

1. Field notes templates
2. All applicable field forms
3. Pen, Pencil, Marking Pens
4. Calculator
5. Scale ruler
6. Flagging
7. Forest Practice Application to be reviewed

8. Pertinent information included in file, but not in FPARS
9. Any approved Watershed Analysis prescriptions, Alternate Plans, land exchanges, or other agreements that may apply to the FPA
10. Site class map for applications with bordering Type S or F Waters
11. Logger's tape, String box, and/or Laser range finder and reflectors
12. Diameter tape or Biltmore stick
13. Clinometer
14. Camera, walkie talkies, and extra batteries.
15. Forest Practices Rule book

FIELD PROTOCOLS, RULE CLARIFICATIONS, AND OTHER ISSUES

1. Choosing Riparian Management Zones (RMZ's), Wetland Management Zones (WMZ's), and Equipment Limitation Zones (ELZ's) activities to be sampled.

    a. *Each different activity type on the FPA will be reviewed*. Only one stream segment associated with each activity type will be assessed. For example, if an FPA has two Option I harvests and one Option II harvest, only **one** Option I harvest will be chosen along with the **one** Option II harvest. This is also the case for Type Np and Type Ns harvests.
    b. *Sub sampling of stream segments*
        i. *For FPA's with Type S or F segment.*, For instances where there are more than one F or S stream segment using the same harvest option, the program uses a statistically designed spreadsheet with random generated numbers to select the stream segment for review. This spreadsheet contains a random function and is available from CM division staff and on the SharePoint site. *For stream segments or water bodies without designators such as non-numbered Type Np and Ns streams.* The DNR Division staff will select the Type Np and/or Type Ns stream segments based on a predetermined method for assigning stream numbers for these stream segments. Numbering will begin in the upper left hand side of the FPA, and proceed as if reading lines of text. When all stream segments have been numbered, we will select the stream using the random number spreadsheet and send those assignments with the stream segments clearly identified to review participants. *Where present, also examine one eac*h of streams labeled "U", "N" or crossed out by the applicant
        ii. *For non-existing streams that are shown on the FPA.* We will use the random order selection spreadsheet to choose the next segment in random order with the reduced number of stream segments. For example, if we had four Np streams and the #3 was chosen, then that stream was not existent, we would re-select the next segment using 3 streams in the random selection spreadsheet. *We* will then be able to review another stream segment on the FPA. This will allow us to use our field review time efficiently.
        iii. Some streams may be the harvest unit boundary. If this occurs the stream will be included with similar stream types for review. If there is no harvest option assigned to the stream segment and there is no information on the FPA, we will assume there will not be harvest in the RMZ. If the segment does not have a letter or number, the DNR Division staff will assign one in a manner similar to section ii above.
    c. *For segments with double sided RMZs.* Survey both sides or as designated by FPA in (b) above. If both sides on the stream are the same harvest option, group the options together before selecting stream segments.
    d. *For surveys along Type S or F water with no inner zone management:* Survey entire length or perimeter within the same site class as shown on the FPARS site class maps, including branches of the same stream system.

e. *For surveys along Type Np or Ns water:* Survey entire length, including branches of the same stream system (if branches have same indicator provided by landowner).

2. Stream measurement
   a. *For RMZs larger than those required in the rules.that are measured from bankfull widths*
      i. When a landowner chooses to begin RMZ measurements farther inland than bankfull width to protect the resource due to circumstances including but not limited to difficult bfw locations due to blowdown, associated wetlands, multiple channels, or indeterminate channel migration zone (CMZ) calls the field review team should attempt to mimic the bfw marked on the ground. This will allow the compliance monitoring field team to assess the requirements of the rules as shown on the ground. This circumstance can only be considered if sufficient flagging or marking on the ground to determine that the landowner used a bfw location greater than needed.
      ii. Stream width for all water types is BFW as defined in WAC 222-16-031 and described in Board Manual section 2. Standard Methods for Identifying Bankfull Channel Features and Channel Migration Zones.
   b. RMZ lengths will be measured along the outer edge of the core zone or inner zone. This will correspond better with RMZ lengths reported for all DFC options.

3. RMZ Measurements

. Deterrmining RMZ widths

   a. Measured with a string box, logger's tape, or laser range finder.
   b. Measure and flag appropriate buffer widths at perpendicular/equal angles from BFW or CMZ of stream.
      i. First measurement is 0+00 at one end of stream segment as mapped in FPA (you choose and write in notes).
   c. For stream segments under 850 feet.
   d. i.first station is 0+00
   e. ii.second station is 0+25
   f. iii. every 50ft. thereafter
   g. e. for segments shorter than 500 ft. take BFW every 25 ft.
      i. Determine segment distance by taking stream length reported in FPA or measured on map and divide by 10. This will give each segment length of stream length.
      ii. The second measurement will be half of the segment length.
   h. For stream segments over 1000 feet, segments will be 100' stream length.
      i. 0+50 is second measurement.
   i. If terrain, brush, blow down, etc., doesn't accommodate above stationing, use what works for visibility and note in field notes what these offset distances and directions are. If measuring BFW you must still follow stationing in (a, b, and c above.)
   j. Overlapping RMZs: (See diagrams on page 32)
      i. Continue flagging across overlapping RMZ's. Note on flags which segment they are for to avoid confusion during tree counts
      ii. Trees in these overlapping areas count towards the leave trees for each stream in its respective RMZ.
   k. Flagging
      i. Choose your own color(s).
      ii. Use different colors for different zones/width measurements.
      iii. Write color choices in field notes templates cover page.
      iv. Write station and date on flagging at the stream location and inner zone/outer zone location

v. Flag all zone boundaries, including floor/CC-IZ and outer edge of outer zone.

a. Determining starting points for stream lengths.
   i. Segment starting point can be identified on the FPA or in field.
   ii. Confluence of two streams.
   iii. Edge of harvest unit.
   iv. Point indicated on map.
   v. Marked in field.
   vi. If landowner is present, he can direct the team to the start of the segment.
   vii. If the segment location is difficult to determine on the FPA or in field, come to a consensus and document the location in the notes.
b. Tools to measure stream length
   i. String box.
   ii. Loggers tape.
   iii. Laser range finder

c. Determining stream and channel migration widths:
   i. Measuring stream and channel migration widths will be completed per the approved application stream characteristics and types. Any discrepancies will be noted in the field on the appropriate form.
   ii. Core zones on Type F and S streams begin at the outer edge of BFW or CMZ, whichever is greater. Np buffers begin at BFW. No regulatory CMZs are included in the rules for type N waters with the exception of alluvial fans. See WAC 222-16-010 "Riparian Management Zone (RMZ) means" and "sensitive sites".
   iii. For type F channels that are obviously greater or less than 10 feet in Western Washington, or 15 feet in Eastern Washington, bankfull width measurements are **not necessary**. For channels that are not obviously discernible, bankfull width should be measured with at least 10 evenly spaced measurements over a representative section of at least 500 feet.
   iv. For channels which appear very close to the 10 or 15 ft threshold, observe up to twice the minimum sample intensity to obtain a better estimate of the mean.
   v. CMZ width locations are determined by using field form from Board Manual 2. This field form is a hierarchical flow chart and starts at the top and progresses to the bottom. You need to satisfy the first criteria before you can proceed to the next criteria etc.
      (i) If the landowner stated that there was no CMZ, measure from BFW.
      (ii) If it is determined that a CMZ existed, then CMZ determinations are made on the overall stream characteristics.
      (iii)If there are field discrepancies on bankfull width (BFW) or channel migration zones (CMZ) determinations, the field team should discuss for 10 to 15 minutes. If consensus cannot be reached, note this in comments section and answer field form accordingly. Move on to the next station. Note issues on appropriate forms.

3. Document in field forms if BFW, or a regulatory CMZ is present or is in conflict with the approved FPAs per the WAC 222-16-010 definition for "Riparian management zones" for Type N waters the RMZs are measured horizontally from the outer edge of the bankfull width. (No regulatory CMZ is associated with Type N waters)
4. Activity Types
   a. **Activities for Western Washington**
      i. S and F streams segments
         A. DFC Option 1
         B. DFC Option 2

C. No inner zone harvest
D. No outer zone harvest

ii. Np stream segments
A. No harvest Np Buffer
B. Harvest along Np streams: See type Np waters below

iii. Ns stream segments
A. Equipment Limitation Zone

d. **Activities for Eastern Washington**:

i. S and F streams segments
A. Eastern Washington inner zone harvest (separate attribute for forest habitat type No outer zone harvest
B. No inner zone harvest

ii. Np stream segments (ELZ also applies to all options)
A. No Harvest Np Buffer
B. Partial Cut harvest along Np streams:
Clear-cut harvest along Np

iii. Ns stream segments
A. Equipment Limitation Zone

5. No harvest buffers for all water types

a. Eastern and Western Washington

i. Includes Core, Option 2 Floor Zone, no inner zone harvest, no harvest Np buffers, or other designated no harvest buffers.

ii. Between every station, determine if there were trees harvested within the no harvest buffer.
A. Between appropriate stations in field notes record:
I. Number of trees cut.
II. Approximate size, when appropriate.
III. Distances from BFW
(i) If there are any questions that the BFW may be a factor, re-measure from the stump to the BFW and record distance in field notes. This extra measuring will help to compensate for sinuosity, bank erosion, etc along the continuous RMZ width.
(ii) For line trees, count every other tree as in, just as in standard property line compensation for line trees.
IV. These parameters apply to all trees cut within any no harvest buffer, including those within the 5% measurement uncertainty
(i) When answering the questions on the field forms
(ii) Trees cut inconsistently within the 5% measurement uncertainty puts the activity in compliance, so be sure to differentiate these from trees outside of the 5% measurement uncertainty.
V. Trees cut consistently within the 5% measurement uncertainty puts the activity out of compliance.
VI. For exceeds determinations:
(i) Record buffer widths when the buffer is consistently ≥20% wider than the rule requirement.
(ii) Np stream buffers: record up to 20% more than the length of no-cut buffer than is required by rule. For example, a landowner would exceed the rule if the required

length of Np no cut buffer is 500 feet and the landowner leaves additional 100 feet of buffer (20% X 500').

(iii)(i) and (ii) don't apply when other rules require a greater buffer than the RMZ or WMZ rule (i.e. bounding out of unstable slopes).

5. Inner zone

a. Western Washington:

i. DFC Option 1, Thinning From Below

A. Tally 100% of the inner zone trees listed in the DFC print out as leave tree requirements by 2 inch dbh class.

I. Tree diameters can be measured with either a diameter tape or a Biltmore stick.

II. Check for stumps that appear to have been trees of dbh larger than the thinning strategy allowed.

(i) We cannot determine exactly what the dbh would have been for a stump on the ground, however using professional judgment we can determine if the tree stump was greater than the thinning strategy allowed.

(ii) If absolutely needed, we could, measure the remaining trees at two points such as the DBH and at a point below DBH that would approximate the height of the stumps to determine a ratio of tree diameter to stump diameter to validate the call.

ii. DFC Option 2, Leaving Trees Closest To Water:

A. Tally trees cut in "no harvesting allowed" designation from the DFC print out (aka "floor zone").

B. Tally required trees in the outer portion of inner zone, per DFC print out.

(i) Trees must be conifer 12 inches or greater in diameter. These are not by size class, and must be ≥20TPA.

C. See notes templates for Option 2.

I. Tree diameters can be measured with either a diameter tape or a Biltmore stick.

II. Count all trees for the inner zone requirement up to twice the number needed. If more than twice the number are present, record compliance as "exceeds"

b. Eastern Washington:

i. Inner zone Ponderosa pine, mixed conifer, and high elevation.

A. Calculate the acreage of the inner zone based on the correct width and length.

B. Verify basal area and required leave trees per acre as outlined in the questions on riparian field form 6 for inner zone management in the three different habitat types.

I. All stream segments: 100% cruise shall be done.

C. Tally dbh by 2" diameter classes and hardwood vs. conifer.

D. Calculate basal area per acre.

I. Basal area calculations are built in to the Excel worksheets and can be used electronically or manually. Also see 'Board Manual Section 7, Appendix D, Determining Basal Area'.

E. Calculate trees per acre.

F. High elevation, only: calculate percent conifer along with D and E, above.

I. Refer to Board Manual Section 7, Appendix G, Western Washington Preliminary Riparian management Zone Screening Stand Tables to verify the leave tree requirements. Note: this is because WAC 222-30-022 (1)(b)(iii)(B) refers to WAC 222-30-021 (1)(b). Because it is difficult to run DFC with Eastern Washington parameters, we will use Appendix G.

6. Outer zone:

a. **Western Washington**:
   i. Determine from the FPA if trees are dispersed or clumped and if the locations of the clumps are shown on the FPA.
   ii. Determine from the FPA if any basal area exchanges apply
   iii. Tally the outer zone leave trees of conifer 12"or greater up to twice the appropriate number. See table on page 28
   iv. For all harvest options,, calculate 20 tpa for dispersed strategy.
   v. For Option 2, follow DFC specifications in FPA.
   vi. For basal area exchanges for all harvest options, see approved plan in FPA.
      A. CMZ exchanges
         I. Tally 100% of the CMZ trees: conifer tally must be greater than or equal to 6" dbh and hardwood tally must be greater than or equal to 10" dbh.
      B. Conifer in the CMZ equal to or greater than 6" dbh will offset conifer in the outer zone at a one to one ratio
      C. Hardwood in the CMZ equal to or greater than 10" dbh will offset hardwood in the outer zone at a one to one ratio.
      D. Hardwood in a CMZ equal to or greater than 10" dbh will offset conifer in the outer zone at a three to one ratio.

b. **Eastern Washington:**
   i. Tally 100% the outer zone trees until the appropriate numbers and sizes of required leave trees have been counted.
   ii. Ponderosa pine habitat type - leave 10 dominant or codominant trees
   iii. Mixed conifer habitat type – leave 15 dominant or codominant trees
   iv. High elevation habitat type – See 222-30-021 (1) (c)
      A. With regard to "exceeds" category: after counting required number of leave trees, count extra trees until you have reached twice the requirement.

   v. Outer zone leave trees may be reduced by up to 50% with LWD placement strategy including HPA approved by WDFW, which must be included in the FPA.

7. Salvage in Riparian Management Zones:

a. Lay out RMZs where salvage occurred per the FPA**.**
   i. Core zone and/or CMZ:
      A. Tally any downed trees salvaged that originated from the core zone or CMZ, even if any portion of it lies in the inner or outer zones.
   ii. Westside Inner zone:
      A. DFC worksheet must be included with FPA for salvage of stumps, snags, and/or down wood.
         I. Verify DFC if there is any salvage
      B. Tally 100% of remaining down wood when salvage of down wood has occurred.
         I. See notes template for salvage.
         II. See table for down wood requirements under 'Riparian and Wetland Management Tables' on page 26.
   iii. Eastside Inner zone:

A. If there is no salvage proposed, tally any down trees salvaged that originated from the inner zone, even if any portion of it lies in the outer zone or beyond.
B. Basal area per acre calculations must be included with FPA for salvage of stumps, snags, and/or down wood.
C. Verify basal area per acre calculations if there is any salvage
D. Tally 100% of remaining down wood when salvage of down wood has occurred
    I. See notes template for salvage.
    II. Ponderosa pine habitat type – 12 tons of down wood per acre must be left: 6 pieces greater than 16 inches in diameter and 20 feet long, and 4 pieces greater than 6 inches in diameter and 20 feet long, and landowner does not need to create downed wood
    III. Mixed confer habitat type - 20 tons of downed wood per acre; 8 pieces greater than 16 inches in diameter and 20 feet long, and 8 pieces greater than 6 inches diameter and 20 feet in length , and landowner does not need to create downed wood.
    IV. High elevation habitat type - 30 tons of downed wood per acre; 8 pieces ` greater than 16 inches in diameter and 20 feet long, and 8 pieces greater than 6 inches in diameter and 20 feet long, and landowner does not need to create downed wood

iii. <u>Outer zone:</u>
A. If there is salvage evidence of recently downed trees, outer zone leave trees must be counted.
B. See number ***6*** above.

8. <u>Type Np waters</u>

i. <u>Upper most point of perennial flow (UMPPF, (old name PIP)The UMPPF can vary during a year or from ye</u>ar to year.
A. Landowners are encouraged to mark the location of the UMPPF, and we will measure from their locations.
B. We will measure the maps and try to come up with the location from the map (ie at the junction of two or more Ns streams, the base of an outcrop, etc.
    I. If there is an obvious 56 foot radius area (50ft. in E WA) with leave trees, and the flow may be in a different location, there is not a standard method to determine if the location changed or not. Use applicants field marking or leave trees, where present.

    II. If the UMPPF is located on the map, use the best measurement you can attain from the map.
    III. If there is a 112 foot circle (100ft. in E WA) of leave trees around the approximate location from the map use this information.

b. Np RMZ as a harvest buffer
i. Measure a 50 foot no cut buffer unless otherwise stated in the FPA.
c. Harvesting Np RMZs
i. Look for equipment entry into the 30 foot equipment limitation zone (ELZ).
ii. If there was entry, look for 10% soil exposure and/or mitigation for soil exposure.
iii. Look for harvest within BFW of any Np water
iv. No salvage is permitted in the buffered portion of an Np RMZ

9. Non buffered portions of Type Ns streams:
    a. Look for equipment entry into the 30 foot equipment limitation zone (ELZ).
    b. If there was entry, look for 10% soil exposure and/or mitigation for soil exposure.

10. Wetland Management Zones:

    a. Verify wetland type and size: see wetland definitions and WMZ table under "RULES AND RULE CLARIFICATIONS" section on page 23. This can be done concurrently with WMZ measurement.
    b. Measure the WMZ per the wetland as typed in the approved FPA. Use a GPS to get area, or measure with a laser rangefinder to get widths along the wetland. You can then average the widths for the length of the wetland to get an approximate area for the wetland.
    c. If the FPA specifies a set (not average) WMZ width with no harvesting, follow the protocol for measuring RMZs under streams
    d. For harvest in the WMZ with a variable width buffer:
        i. Follow the boundary as marked on the ground by the applicant, if available.
        ii. Calculate WMZ acreage:
            A. Measure variable widths and distances of the WMZ and put in notes template.
                I. These will be used for estimating WMZ acreage and checking for width and spacing of openings in WMZ.
            B. OR use a GPS to traverse the WMZ and calculate acreage.
        iii. Tally 100% of the trees in the WMZ.
            A. See field notes templates for WMZ (by diameter category).
            B. Calculate trees per acre of each rule requirement:
                I. Western Washington
                    (i) 6 to 12 inches dbh trees
                    (ii) Greater than 12 inches dbh trees
                    (iii)Greater than 20 inches dbh trees
                II. Eastern Washington – tally conifer and hardwood separately for each size class
                    (i) 4 to 12 inches dbh trees
                    (ii) Greater than 12 inches dbh trees
                    (iii)Greater than 20 inches dbh trees
        iv. If the WMZ laid out by the applicant does not have either 25 TPA greater than 12 inches dbh or 5 TPA greater than 20 inches dbh, you must check the maximum WMZ per the Wetland Management Zones table for trees and/or stumps that would fall into these categories.

11. 11. 20 acre exempt and Alternate Plans FPA's
review only those activities, if any, that still fall under standard rules

12. Stream Typing

a. Compliance monitoring does not perform stream typing
b. Field review completed activities are per the stream typing on the approved FPA and current DNR hydro data.
c. For possible discrepancies on water typing fill out the "Supplemental Stream Evaluation" that was developed to determine the magnitude of the stream typing issue

13. Roads

a. Where roads are located high and dry and are judged by the team to have "No potential to deliver" (NPTD), write NPTD in the roads question Form #1 rather than compliant or non-compliant.
b. Review all new construction, abandonment, and N stream crossings listed on the FPA.
    i. Read and use the forms to be sure to address the issues on the road segments for review.
    ii. New construction activity will be driven or walked for the entirety of the activity.
    iii. Where roads are utilized for multiple applications such as main haul routes, review the road as is and note this in the comment section.
    iv. Review up to a total of 2500 feet of road abandonment segments as listed on the FPA.
        A. If there are multiple abandonment sections to be reviewed, start with the segments furthest north and/or east on the application.
c. Stream adjacent parallel roads Western Washington
    i. The only time a stream adjacent parallel road is an issue is if the harvest is an Option 2 harvest and the basal area components of the stand requirement cannot be met within the sum of the areas in the inner or core zones:
        a. A determination must be made of the approximate basal area that would have been present in the inner and core zones if the road was not occupying space in the core and inner zone.
        b. Trees containing basal area equal to the amount determined above will be left elsewhere in the inner or outer zone, or if the zones contain insufficient riparian leave trees, substitute riparian leave tress will be left within the RMZ of other Type F or S streams in the same unit. See WAC 222-30-021 (1) (b) (ii) (B) (II) (iii) (A).
d. Stream adjacent parallel roads Eastern Washington
    i. For streams greater than 15 feet:
        a. If the edge of the road is 75 or more from the BFW or CMZ no harvest is permitted in the inner zone
        b. No harvest is permitted within the inner zone on the stream side of the road, however, if the road is less than 75 ft from the BFW or CMZ additional leave trees equal to basal area lost to the road will be left near the streams in or adjacent to the unit.
        c. If leave trees are not available landowners and operators will employ site specific management activities to replace lost riparian function which may include placement of large woody debris.

ii. For streams less than 15 feet:
    d. If the edge of the road is 50 feet or more from the BFW or CMZ no harvest is permitted in the inner zone
    e. No harvest is permitted within the inner zone on the stream side of the road, however, if the road is less than 50 ft from the BFW or CMZ additional leave trees equal to basal area lost to the road will be left near the streams in or adjacent to the unit.
    f. If leave trees are not available landowners and operators will employ site specific management activities to replace lost riparian function which may include placement of large woody debris.

14. <u>When should an individual activity or FPA be removed from the compliance monitoring sample?</u>
    a. Activities for field review will be determined before each field season. The following circumstances would allow us to drop an activity or FPA from the sample:
       If no activity relating to the sample criteria was planned, that FPA will be removed from the sample.
       If harvest or road work never occurred on the FPA, the whole FPA will be dropped from the sample.
    b. If a stream did not exist on the ground, but was on the FPA, activity will be removed from the sample.
    c. If no harvest occurred within twice the specified ELZ, RMZ or WMZ width the activity is dropped from the sample and no call is determined for compliance or non-compliance. (e.g.no harvest within 60' of Ns water, 100' of Np, 280' of Type F on Site Class III, etc.)
    d. See the Compliance Monitoring Program Design for other particulars of sampling.

COMPLIANCE DETERMINATIONS ON POST SURVEY EVALUATION FORM

The "compliant" determination

"Compliant" in the context of the Compliance Monitoring Program means that a forest practice was conducted in conformance with the Forest Practices Act and forest practices rules according to site-specific characteristics. By signing and submitting an FPA, a landowner is conveying an intention to conduct certain forest practices on lands with specified site characteristics. The landowner's signature on that FPA is an acknowledgement that the landowner understands activities must conform to the rules.

It is important to note that there can be situations where landowners are compliant with the rules for site characteristics identified on the FPA, but because of a misidentification of a site characteristic, the field team must make a "non-compliance" determination. For example, a landowner may specify in an FPA that a Type F stream less than or equal to 10 feet wide runs through the forest practices activity area and the landowner provides the appropriate RMZ width on the ground. The FPA is selected for compliance monitoring, and the team measures the stream using the required protocols and determines the stream width is greater than 10 feet. Although the landowner was compliant with the rule for streams less than or equal to 10 feet, the compliance monitoring determination is "non-compliant" for that particular RMZ.

There also can be situations where landowners' activities have *exceeded* the rules. The landowner community has requested that these instances also be reported.

DNR, with input from other resource agencies and representatives of Forests and Fish Policy, has developed the following definition for the "compliant" category, and a definition and criteria for "exceeds."

Compliant: Meets protection identified in the approved FPA and rules.(compliance with rules and FPA as approved are reported separately).

***Exceeds Rule**:* Landowners exceeded the protection identified in the rules for their forest practices activities. Common examples are:

- For Type S or F Waters: Twice as many trees in the inner and outer zones of RMZs were retained as were required by rule or DFC worksheet.
- "extra" leave trees in option 1 inner zones do not count towards exceeds rating, as they undermine rationale for allowing harvest there to begin with
- For Type S, F, or Np Waters: RMZ width is 20% greater than required by rule.
- For Type Np Waters: No cut RMZ length is 20% greater than required by rule.
- "Extra" trees that were required to be left for other reasons, e.g. tributary buffers or unstable slopes, do not count towards an "exceeds" rating.
- Road improvements were more protective than required by rule.

- Road abandonment activities (e.g., mulching, distribution of trees and woody debris along road prism to deter off-road vehicle travel) were more protective than required by rule.

The "non-compliant" determination

Non-compliant: Does not meet protection identified in the approved FPA and/or rules. Common examples are:

- RMZs were harvested beyond the pre-determined 5% measurement uncertainty protocol.
- Leave tree requirements were not met.
- Water-crossing structures were inadequate for stream protection standards.
- Stream size reported on the Desired Future Condition (DFC) worksheet deviated more than 10% of the stream size measured during compliance monitoring in the field.

As indicated in the introductory portion of this section, a "non-compliant" determination is reported in absolute terms, but qualitative information derived from professional judgment in the field is also reported to the Board. After considering several ways to structure a system of reporting "non-compliant" determinations, DNR with the help of input from WDFW, developed the following categories to help field personnel use professional judgment in reporting their findings:

Non-compliant - Minor Minor impacts of short duration over a small area. This level of impact may be compared to the first level of DNR regulatory protocol: DNR informs the landowner, by phone or other informal means, of minor deviations from the rules. Common examples are:

- A few trees harvested in the inner or outer zone of the RMZ of the same ecological significance as the remaining trees in the RMZ.
- Evidence of slight sediment delivery that does not appear to be persistent.

Non-compliant - Moderate Potential impacts to resources, but generally of moderate effects. This level of impact may be compared to the "Notice to Comply" level of DNR regulatory protocol where a landowner is informed that some mitigation is required. Common examples are:

- The required outer zone trees are not retained.
- Culvert sizing is questionable, but potential impact to resources is not readily apparent.
- Soil stabilization activities have not occurred and there may be a potential for future impacts.

Non-compliant - Major Damage to public resources is evident or the potential for damage is high. These include situations normally referred to the DNR region for

enforcement consideration. The comparable level of action by DNR regulatory staff would be to initiate enforcement action where mitigation measures are identified to address resource or potential issues.
Common examples are:

- Harvest in the core zone.
- Harvest in areas not delineated on the FPA.
- Road construction without an FPA.
- Evidence of direct sediment delivery to typed water that appears to have been persistent.

Non-compliant - No consensus. Participants cannot agree on the non-compliance rating Non-consensus is also recorded and reported to the Board.

It is important to note that these professional judgment non-compliance ratings should not be used to excuse activities that violate the rules or approved FPAs. This process helps to put some perspective to the magnitude of damage or potential damage under rules that are intensely prescriptive.

Implementing this system requires the following assumptions:

- All participants realize that this process relies on professional judgment and agree to the broad categories, and acknowledge that this process is not meant to represent any effectiveness determination.
- There will be no statistical analysis beyond the narrow scope intended. These decisions are used as a snapshot of the conditions on the ground at the time of field review.

RULES, DEFINITIONS, AND RULE CLARIFICATIONS

THE FOLLOWING IS EXCERPTED FROM WAC 222-16

"Bankfull depth" means the average vertical distance between the channel bed and the estimated water surface elevation required to completely fill the channel to a point above which water would enter the floodplain or intersect a terrace or hillslope. In cases where multiple channels exist, the bankfull depth is the average depth of all channels along the cross-section. (See board manual section 2.)

"Bankfull width" means:

(a) For streams - the measurement of the lateral extent of the water surface elevation perpendicular to the channel at bankfull depth. In cases where multiple channels exist, bankfull width is the sum of the individual channel widths along the cross-section (see board manual section 2).

(b) For lakes, ponds, and impoundments - line of mean high water.

(c) For tidal water - line of mean high tide.

(d) For periodically inundated areas of associated wetlands - line of periodic inundation, which will be found by examining the edge of inundation to ascertain where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland.

From WAC 222-16-010

"Riparian management zone (RMZ)" means:

(1) **For Western Washington**

(a) The area protected on each side of a Type S or F Water measured horizontally from the outer edge of the bankfull width or the outer edge of the CMZ, whichever is greater (see table below); and

Site Class	Western Washington Total RMZ Width
I	200'
II	170'
III	140'
IV	110'
V	90'

(b) The area protected on each side of Type Np Waters, measured horizontally from the outer edge of the bankfull width. (See WAC 222-30-021(2).)

(2) **For Eastern Washington**

(a) The area protected on each side of a Type S or F Water measured horizontally from the outer edge of the bankfull width or the outer edge of the CMZ, whichever is greater (see table below); and

Site Class	Eastern Washington Total RMZ Width
I	130'
II	110'
III	90' or 100'*
IV	75' or 100'*
V	75' or 100'*

* Dependent upon stream size. (See WAC 222-30-022.)

(b) The area protected on each side of Type Np Waters, measured horizontally from the outer edge of the bankfull width. (See WAC 222-30-022(2).)

WA C 222-30-021(1)(c)

((iii) **Large woody debris in-channel placement strategy.** A landowner may design a LWD placement plan in cooperation with the department of fish and wildlife. The plan must be consistent with guidelines in board manual section 26. The landowner may reduce the number of trees required to be left in the outer zone to the extent provided in the approved LWD placement plan. Reduction of trees in the outer zone must not go below a minimum of ten trees per acre. If this strategy is chosen, a complete forest practices application must include a copy of the WDFW approved hydraulics project approval (HPA) permit.)

(iv): **Outer zones, twenty riparian leave trees must be left after harvest** with the exception of the following:(A) If a landowner agrees to implement a placement strategy, see (iii) of this subsection.(*See above)*

(B) If trees are left in an associated channel migration zone, the landowner may reduce the number of trees required to be left according to the following:

(I) Offsets will be measured on a basal area-for-basal area basis.

(II) Conifer in a CMZ equal to or greater than 6" dbh will offset conifer in the outer zone at a one-to-one ratio.

(III) Hardwood in a CMZ equal to or greater than 10" dbh will offset hardwood in the outer zone at a one-to-one ratio.

(IV) Hardwood in a CMZ equal to or greater than 10" dbh will offset conifer in the outer zone at a three-to-one ratio.

(C) For Option 2 harvest units only, up to 50% of the outer zone leave trees may be harvested if there is sufficient surplus basal area credit from the inner zone, as documented on the DFC printout.

WAC 222-16-035 Wetland typing system. *The department in cooperation with the departments of fish and wildlife, and ecology, and affected Indian tribes shall classify wetlands. The wetlands will be classified in order to distinguish those which require wetland management zones and those which do not. Wetlands which require wetland management zones shall be identified using the following criteria: *(1) **"Nonforested wetlands"** means any wetland or portion thereof that has, or if the trees were mature would have, a crown closure of less than 30 percent.

(a) **"Type A Wetland"** classification shall be applied to all nonforested wetlands which:

(i) Are greater than 0.5 acre in size, including any acreage of open water where the water is completely surrounded by the wetland; and

(ii) Are associated with at least 0.5 acre of ponded or standing open water. The open water must be present on the site for at least 7 consecutive days between April 1 and October 1 to be considered for the purposes of these rules; or

(b) **"Type B Wetland"** classification shall be applied to all other nonforested wetlands greater than 0.25 acre.

*(2) **"Forested wetland"** means any wetland or portion thereof that has, or if the trees were mature would have, a crown closure of 30 percent or more.

*(3) "All forested and nonforested bogs" greater than 0.25 acres shall be considered Type A Wetlands.

*(4) For the purposes of determining acreage to classify or type wetlands under this section, approximate determination using aerial photographs and maps, including the national wetlands inventory, shall be sufficient. In addition, the innermost boundary of the wetland management zone on Type A or B Wetlands may be determined by either of two methods: Delineation of the wetland edge, or identifying the point where the crown cover changes from less than 30 percent to 30 percent or more.

1.2 Identifying Bankfull Width and Bankfull Depth

The edge of the bankfull channel typically corresponds to the start of the floodplain. A floodplain receives floodwaters in most years, but is generally vegetated by perennial plants and trees. This vegetation often reflects repeated flow-related disturbance and may not support mature trees. The following primary indicators are used to characterize the start of the floodplain:

- **Topography** - A berm or other break in slope from the channel bank to a flat valley bottom, terrace or bench;
- **Vegetation** - A change in vegetation from bare surfaces or annual water-tolerant species to perennial water-tolerant or upland species; and
- **Sediment Texture** - A change in the size distribution of surface sediments (e.g., gravel to fine sand) (Figure 1).

Field determination of the bankfull channel edge generally relies on two or more of the following:

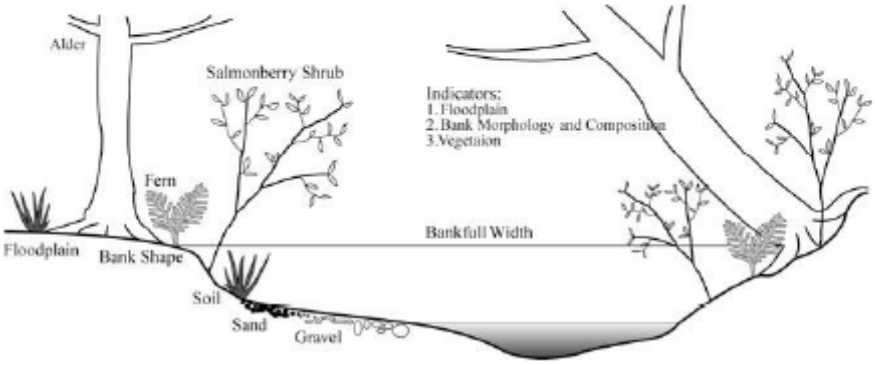


Figure 1. Indicators for determining bankfull width (adapted from Pleus and Schuett-Hames, 1998).

If physical obstructions, such as log jams, or a lack of indicators prevent accurate identification of the bankfull width at a particular point, move to the nearest place where identification is feasible. In cases where the outer edge of the bankfull width is easier to determine on one side of the channel than the other, simply identify the bankfull width on one side and project across at that same elevation to the other bank.

In streams where the substrate is dominated by boulders or bedrock or where the channel is tightly confined, a distinct floodplain may not exist. In these situations, you will have to rely on secondary indicators, such as vegetation or other evidence of flood flows to determine the bankfull width. These indicators may include:

- A change in vegetation from bare surfaces or annual water-tolerant species to perennial upland or water-tolerant shrubs and trees;
- Bare areas associated with scour around woody debris or other obstructions;
- The top of point bars; or
- The lowest elevation at which fine organic debris is caught on brush or trees.

One approach to help identify the bankfull edge is to evaluate the indicators discussed previously from within the bankfull channel looking towards the suspected bankfull edge. Identify the point

where the certainty of being within the bankfull channel is less than 100%. Then, repeat this process, but begin on the floodplain and work towards the channel. This exercise should help narrow the focus to the area between the two markings where more subtle indicators of the bankfull edge may be found (Pleus and Schuett-Hames, 1998).

1.3 Measuring Bankfull Width and Depth

Once the edges of the bankfull channel are determined, one can easily measure bankfull width and the average bankfull depth. A tape measure and measuring rod (such as a surveyor's rod) are useful to make these measurements. String wrapped around wooden stakes may also be helpful to more easily mark reference points. The most common situations where these measurements will be helpful are when one needs to:

- Determine a width category for the RMZ rules (see Board Manual Section 7); or
- Determine functional large woody debris size for CMZs in meandering rivers or as part of the LWD placement protocol. See Board Manual Section 26.

To measure bankfull width, attach or have an assistant hold one end of the tape at the bankfull edge and extend the tape to the other edge of the bankfull channel. The outlets of overflow swales, small islands, log jams, backwater eddies or regularly flooded adjacent wetlands may all occur within the bankfull width. In cases where multiple channels exist, such as around a small island, bankfull width is the sum of the individual channel widths along the cross section.

END PORTION OF BOARD MANUAL SECTION 2

TABLES AND DIAGRAMS

Western Washington **Harvest code tables:**

Harvest code table to be used with FPA dated 05-14-05

RMZ HARVEST CODES
Inner and outer zones
A – Alternate Plan. (*Include Alternate Plan)*
Inner zone (*Include DFC printouts for each stream segment where standing or down wood will be removed).*
B – No inner zone Harvest
C – Hardwood Conversion. *(Include Hardwood Conversion Form)*
D – Thinning from below - Option 1.
E – Leave trees closest to water - Option 2.
F – Salvage
G – Stream-adjacent Parallel Road.
H – Constructing a New Stream Crossing.
I – Road Construction or Day-lighting.
J – Yarding Corridors.
Outer zone
K – No Harvest
L – Leaving 20 trees per acre
M – Leave trees clumped on sensitive features.
N – Leave trees exchanged for LWD placement strategy. *(Include a copy of the placement plan)*
O – Leave trees exchanged for CMZ basal area.
P – Leave trees exchanged for excess inner zone basal area in conjunction with an Option 2 inner zone harvest.
Q – Salvage

Harvest code table to be used with FPA dated 02-28-05

RMZ HARVEST CODE REFERENCE CHART
Inner and outer zones
A – Alternate Plan. (*Include Alternate Plan)*
B – Salvage. *(Include leave tree count in the inner zone. In the outer zone a down wood count may be required).*
Inner zone (*Include DFC printouts for each stream segment where standing or down wood will be removed).*
C – No inner zone Harvest
D – Hardwood Conversion. *(Include Hardwood Conversion Form)*
E – Thinning from below - Option 1.
F – Leave trees closest to water - Option 2.
G – Stream-adjacent Parallel Road.
H – Constructing a New Stream Crossing.
I – Road Construction or Day-lighting.
J – Yarding Corridors.
Outer zone
K – No outer zone harvest
L – Leaving 20 trees per acre
M – Leave trees clumped on sensitive features.
N – Leave trees exchanged for LWD placement strategy. *(Include a copy of the placement plan)*
O – Leave trees exchanged for CMZ basal area.
P – Leave trees exchanged for excess inner zone basal area in conjunction with an Option 2 inner zone harvest.

Eastern Washington RMZ harvest Codes

Inner and Outer Zones
A Alternate Plan. (*Include Alternate Plan)*
Inner Zone
B No Inner Zone Harvest
C Ponderosa Pine Habitat Type (*Provide basal area information or leave tree count by diameter class)*
D Mixed Conifer Habitat Type (*Provide basal area information or leave tree count by diameter class)*
E High Elevation Habitat Type (*Provide DFC information)*
F High Elevation Habitat Type – Hardwood Conversion (*Include Hardwood Conversion Form)*
G Salvage. *(Provide basal area information or leave tree count by diameter class)*
H Existing Stream-adjacent Parallel Road
I Constructing a New Stream Crossing
J Road Construction or Day-lighting
K Yarding Corridors
Outer Zone
L No Outer Zone Harvest
M Ponderosa Pine Habitat Type
N Mixed Conifer Habitat Type
O High Elevation Habitat Type
P High Elevation Habitat Type - Leave trees clumped around sensitive features
Q High Elevation Habitat Type - Leave trees exchanged for CMZ basal area
R Within all habitat types - Leave trees exchanged for LWD placement strategy (*Include a copy of the placement plan)*
S Salvage *(A down wood count may be required)*
Inner and Outer Zones RMZ Harvest Codes
A Alternate Plan: Include a copy.
Inner Zone RMZ Harvest Codes - Choose all that apply. Include basal area information or leave tree count by diameter class for all inner zone harvest. See Board Manual Section 7 (Appendix H) for more information.
B No Inner Zone Harvest
C Ponderosa Pine Habitat Type: If the proposal is between 0' and 2500' elevation, use the Ponderosa Pine Habitat Type inner zone width and stand requirements in WAC 222-30-022(1)(b)(i).

Riparian and Wetland Management Tables

Western Washington

Outer zone riparian leave tree requirements

Application	Leave tree spacing	Tree species	Minimum dbh required
Outer zone	Dispersed	Conifer	12" dbh or greater
Outer zone	Clumped	Conifer	12" dbh or greater
Protection of sensitive features	Clumped	Trees representative of the overstory including both hardwood and conifer	8" dbh or greater

No inner zone management RMZ widths for Western Washington

Site Class	RMZ width	Core zone width (measured from outer edge of bankfull width or outer edge of CMZ of water)	Inner zone width (measured from outer edge of core zone)		Outer zone width (measured from outer edge of inner zone)	
			stream width ≤10'	stream width >10'	stream width ≤10'	stream width >10'
I	200'	50'	83'	100'	67'	50'
II	170'	50'	63'	78'	57'	42'
III	140'	50'	43'	55'	47'	35'
IV	110'	50'	23'	33'	37'	27'
V	90'	50'	10'	18'	30'	22'

Option 1. Thinning from below.

Site class	RMZ width	Core zone width (measured from outer edge of bankfull width or outer edge of CMZ of water)	Inner zone width (measured from outer edge of core zone)		Outer zone width (measured from outer edge of inner zone)	
			stream width ≤10'	stream width >10'	stream width ≤10'	stream width >10'
I	200'	50'	83'	100'	67'	50'
II	170'	50'	63'	78'	57'	42'
III	140'	50'	43'	55'	47'	35'
IV	110'	50'	23'	33'	37'	27'
V	90'	50'	10'	18'	30'	22'

Option 2. Leaving trees closest to water.

Site class	RMZ width	Core zone width (measured from outer edge of bankfull width or outer edge of CMZ of water)	Inner zone width				Outer zone width (measured from outer edge of inner zone)	
			stream width ≤10'	stream width ≤10' minimum floor distance (measured from outer edge of core zone)	stream width >10'	stream width >10' minimum floor distance (measured from outer edge of core zone)	stream width ≤10'	stream width >10'
I	200'	50'	84'	30'	84'	50'	66'	66'
II	170'	50'	64'	30'	70'	50'	56'	50'
III	140'	50'	44'	30'	**	**	46'	**

**Option 2 for site class III on streams >10' is not permitted because of the minimum floor (100') constraint.

Eastern Washington RMZ for streams with bankfull width of less than or equal to 15 feet wide

Site Class	Total RMZ Width	Core Zone Width From outer edge of bankfull width or outer edge of CMZ, whichever is greater	Inner Zone Width	Outer Zone Width
I	130'	30'	45'	55'
II	110'	30'	45'	35'
III	90'	30'	45'	15'
IV	75'	30'	45'	0'
V	75'	30'	45'	0'

Eastern Washington RMZ for streams with bankfull width of greater than 15 feet wide

Site Class	Total RMZ Width	Core Zone Width From outer edge of bankfull width or outer edge of CMZ, whichever is greater	Inner Zone Width	Outer Zone Width
I	130'	30'	70'	30'
II	110'	30'	70'	10'
III	100'	30'	70'	0'
IV	100'	30'	70'	0'
V	100'	30'	70'	0'

Down wood requirements for salvage logging in the inner zone

Logs w/ a solid core	< 1-ft diameter	1-2 ft diameter	>2 ft diameter	Total
# of logs/acre	85	83	26	194

Wetland Management Zones

Wetland Type	Acres of Nonforested Wetland*	Maximum WMZ Width	Average WMZ Width	Minimum WMZ Width
A (including bogs)	Greater than 5	200 feet	100 feet	50 feet
A (including bogs)	0.5 to 5	100 feet	50 feet	25 feet
A (bogs only)	0.25 to 0.5	100 feet	50 feet	25 feet
B	Greater than 5	100 feet	50 feet	25 feet
B	0.5 to 5			25 feet
B	0.25 to 0.5	No WMZ required	No WMZ required	

*For bogs, both forested and nonforested acres are included.

OVERLAPPING RMZS:
Trees in overlapping RMZs count towards the leave trees for each stream in its respective RMZ. However, where the Outer Zone of stream 'A' overlaps a Core Zone or a No Harvest Inner Zone of stream 'B', you cannot count trees in these two zones for the 20 TPA in the outer zone of 'A'. Also, if, the landowner is clumping outer zone trees, they need to clearly acknowledge the locations of these areas on the FPA.

Diagram of Stream A RMZ

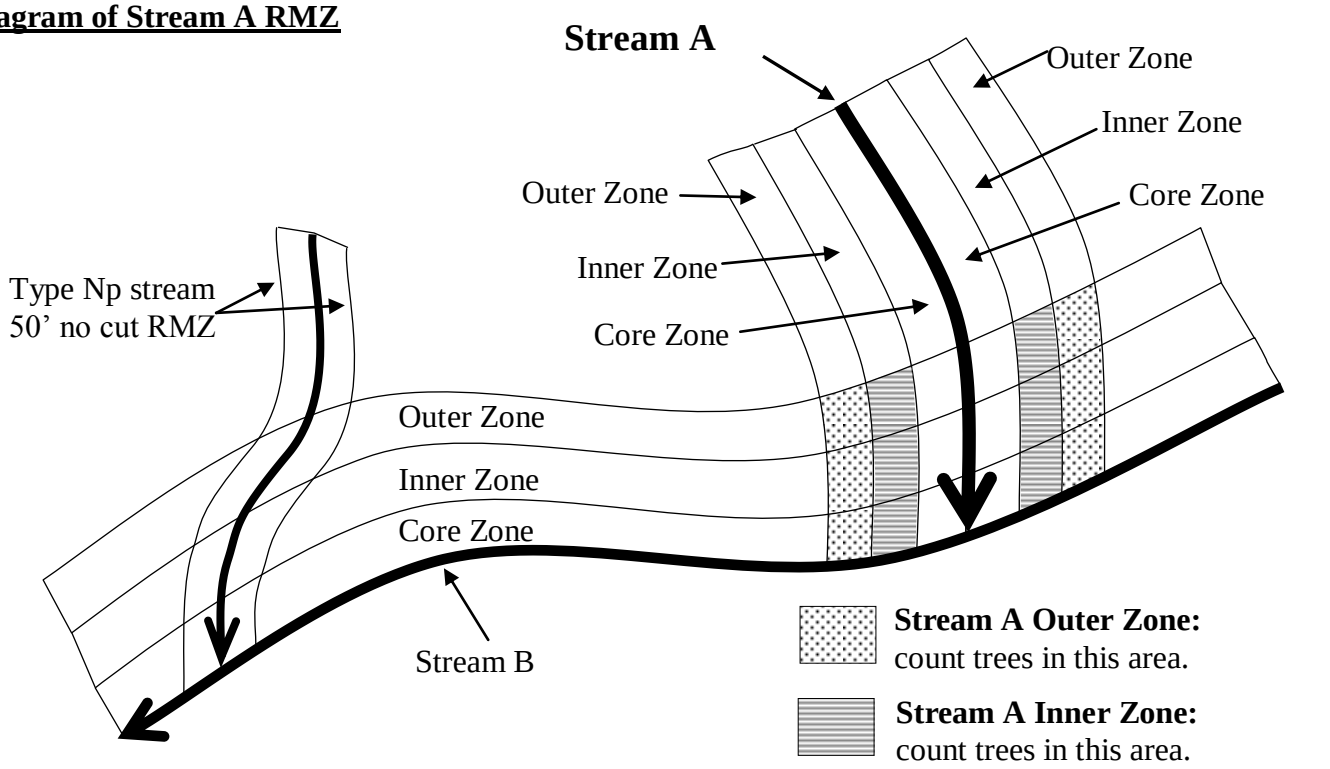
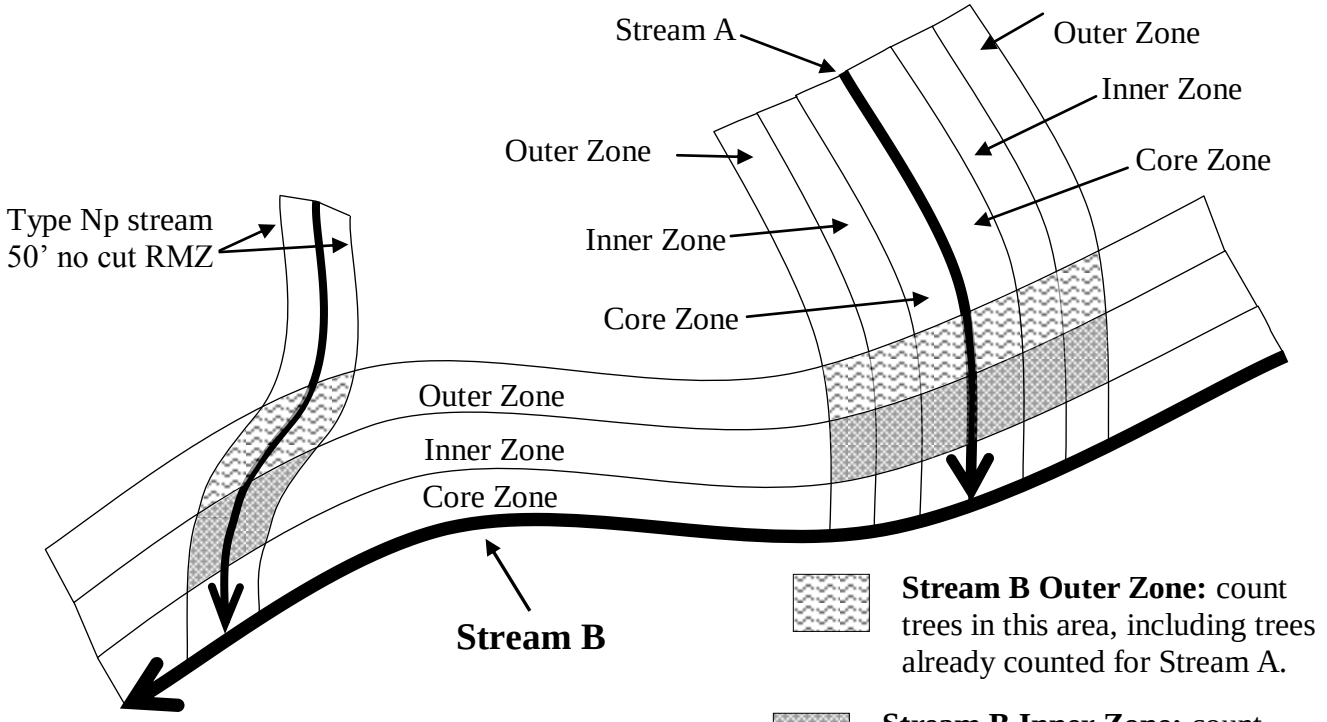


Diagram of Stream B RMZ

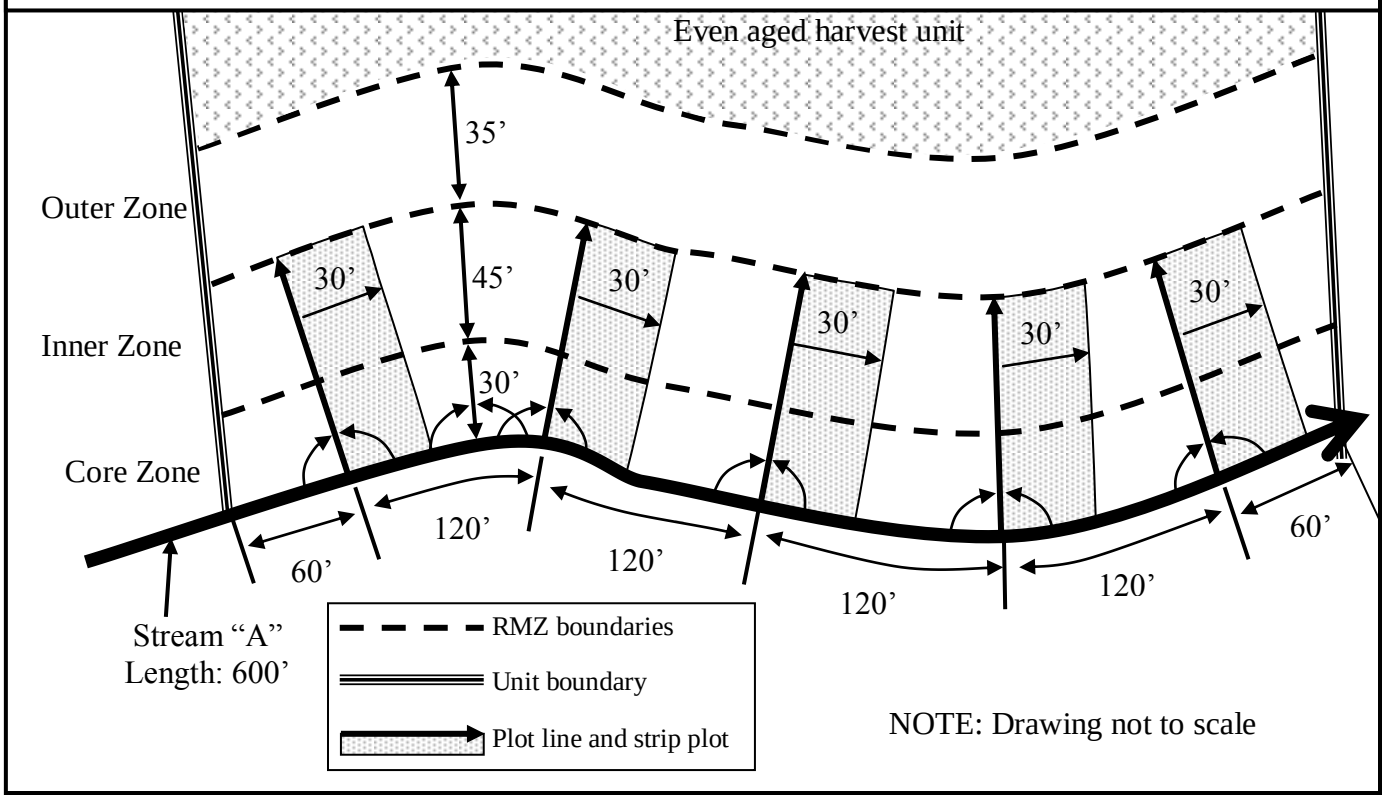


STRIP PLOT EXAMPLE

Follow this example to complete a strip plot cruise: Site class II, stream width less than 15 feet, total RMZ width is 110 feet (see RMZ tables).

1. Strip plots in calculations 1 and 2 and 3, below shall satisfy ALL of the following:
   a. Strip width between 25 feet and 50 feet.
   b. At LEAST 3 strip plots per stream segment.
   c. For example, stream segments longer than 600 feet will have more than 3 plots in order for the strips to be less than 50 feet wide.
1. CALCULATION 1: 25% of RMZ to be sampled.
   .25 X (Stream length) = .25 X 600' = 150'
2. CALCULATION 2: deciding width of strip plots. Five strips will be done for this example.
   (CALCULATION 1) / (number of strip plots) = 150'/5 = 30' wide strip plots
3. CALCULATION 3: plot line spacing
   (Stream length) / (number of strip plots) = 600'/5=120' plot line spacing
4. CALCULATION 4: location of plot line #1
   .5 (CALCULATION 3) = .5 X 120' = 60' from the start of the stream segment
5. BASAL AREA CALCULATION:
   BA/ac. = (total plot BA) / (plot length x plot width in feet) / 43,560 sq. ft.
6. TREES PER ACRE CALCULATION:
   TPA = (total # of plot trees) / (plot length x plot width in feet) / 43,560 sq. ft.

EXAMPLE DIAGRAM: site class II, < 15 feet wide stream, 600' long stream, 110' wide total RMZ.



FORMULAS

Conversion from slope distance to horizontal distance HD = (SA) (cos) (SD)

Enter slope angle in degrees, multiply by cosine, multiply by slope distance:

WORKSHEETS

Western Washington Type Np RMZ Worksheet

A. Without regard to ownership, determine the total length of each separate Type Np stream system where at least a portion of the system is within the harvest unit. This includes the branching network of a Type Np system above the confluence with Type S or F water. See WAC 222-30-021.

Note: There can be more than one Type Np system within a harvest unit and each system requires a separate length determination. Use a separate worksheet for each Type Np system.

B. Determine which of the options below best fits the total length determined for a specific Type Np system. Circle the letter next to the best fit (i.e. letter a., b. or c.).

a. If the total Type Np system length (not just the length within the harvest unit) is less than 300': Leave a two-sided, 50' buffer on the entire length of the Type Np water. Show the RMZ on the Activity Map.

STOP, WORKSHEET COMPLETED.

b. If the total length is greater than 300' but less than 1000': Starting at the confluence with Type S or F water, leave a buffer that is the greater of 300' or 50% of the entire length of the Type Np water. In addition, buffer all sensitive sites on the Type Np stream that were not already buffered by the 300' or 50% requirement. Show the RMZ on the Activity Map.

STOP, WORKSHEET COMPLETED.

c. If the total length is greater than 1000': Leave a two-sided, 50' buffer on the first 500' of the Type N stream above the confluence with Type S or F water. Complete i. through vi. below.

i. Determine the total length of the Type Np system. _____Feet

ii. Refer to the table below to determine the minimum % of buffer required on that portion of the Type Np water upstream of the first 500' from the confluence of Type S or F water. _____%

iii. Determine the length of Type Np water within the harvest unit that is upstream of the first 500' from the confluence of Type S or F water. _____Feet

iv. Determine the total length of buffering needed upstream of the first 500' from the confluence of Type S or F water. (% in ii. times length in iii. = required buffer) _____Feet

v. Determine the total length of all required buffering established to protect sensitive sites along the Type Np water within the harvest unit above the first 500' from the confluence of Type S or F water. _____Feet

vi. If the required buffer length in v. is less than the length in iv., determine the length of additional buffering required. (Length in iv. minus length in v. = additional buffer) _____Feet

The buffering must be placed in priority areas. Show the buffers on the Activity Map.

Minimum percent of length of Type Np waters to be buffered when more than 500 feet upstream from the confluence of Type S or F water.

Total length of a Type Np water upstream from the confluence of a Type S or F water.	Percent of length of Type Np water that must be protected with a 50 foot no harvest buffer more than 500 feet upstream from the confluence of a Type S or F water.
1001 – 1300 feet	19%
1301 – 1600 feet	27%
1601 – 2000 feet	33%
2001 – 2500 feet	38%
2501 – 3500 feet	42%
3501 – 5000 feet	44%
Greater than 5000 feet	45%

Suggested procedures for office review of FPAs prior to fieldwork

Division Pre- season Screening

- Open each application on FPARS, double check FPA # against list for region
- Confirm approval date is within our sample window
- Assure FPA includes activities we are sampling (riparian, roads)
- Examine office checklist for flagged items that might affect our work, e.g. 20 Ac XMT, Alt Plans, HCP, BTO etc.

Region Review Preparation and Facilitation

Make electronic copies (pdf) and distribute to review participants two to three weeks in advance of field review :

- ❑ Maps: include current activity map, current hydro layer (especially important for FPAs with multiple renewals, and those where corporate maps are substituted for FPARS maps)
- ❑ Check WTCW and/or WTMF, if any; note descriptions of physicals used to verify water types
- ❑ Notice of Decision page: any conditions added by approving forester?
- ❑ Any amendments that affect what we're looking at?
- ❑ For renewals, be sure original FPA is included; if not, obtain from region
- ❑ check additional information provided by applicant for anything pertinent or useful

Review lead Responsibilities

- ❑ Completes the pre-review form- including:
- ❑ note types of harvest, equipment and acreage listed in table at harvest question
- ❑ Note road activities to be reviewed in table at road construction question
- ❑ check wetland types, associated activities and WMZs, if any, in wetlands table
- ❑ check activities proposed over typed waters from table: if skidding, watch for ground disturbance; if cable yarding, note that trees cut in RMZ might be for corridors, tailholds etc.
- ❑ Type F RMZ table: note segment IDs, stream widths, site classes, CMZs and harvest codes
- ❑ Type Np RMZ table: note whether full or partial buffer; check lengths proposed against rule requirements, distances from nearest Type F, etc.

Region Review Day items

- ❑ Bring paper copy of FPA
- ❑ Bring paper copies of Field review forms
- ❑ Current activity, water typing and site class maps for each FPA for reference in field, and attach to your copy of FPA